In the Claims

Please amend claims 1-4 and add new claims 5-11 as indicated below. This listing of claims supersedes all prior listings.

1. (~~amended~~ CURRENTLY AMENDED) ~~In a specific embodiment, the invention provides a method of capturing the spectral content of an image. In this embodiment, the method includes:~~ A method of capturing spectral energy content of an image, the method comprising:

a. segmenting the image into an array of pixels, ~~each pixel associated with a distinct spectral energy function signature of the image~~ each pixel of the image having an electromagnetic spectral energy function;

b. ~~for each pixel of the array,~~

~~(i) dispersing spectral energy therefrom into resolved spectral components in a continuous spectrum of interest, such resolved spectral components having a distribution across the entire spectrum typified by an output from a diffraction grating; and~~

b. separately directing the spectral energy element of each pixel to a spectral energy dispersion device that spreads the energy function into a continuous spectrum representative of an entire spectrum of interest; and

~~(ii) determining an amplitude value for each of the resolved spectral components.~~

c. for each pixel, functioning as a spectrum analyzer, determining an amplitude value for each of the resolved spectral components.

2. (~~amended~~ CURRENTLY AMENDED) . ~~In a further related embodiment, the spectral energy dispersion device in claim 1 is implemented as part of a spectrophotometer.~~ A method according to claim 1, wherein the spectral energy content is that of light and determining an amplitude value includes using a spectrophotometer.

3. (~~amended~~ CURRENTLY AMENDED) ~~3. In an additional related embodiment, determining an amplitude value for each of the spectral components in claim 1 includes using a linear array of photo-detectors to evaluate the output of the spectrophotometer.~~ A method according to claim 2, wherein using the spectrophotometer includes using a linear array of photo-detectors in the spectrophotometer to evaluate the amplitude value for each of the resolved spectral components.

4. (~~amended~~ CURRENTLY AMENDED) ~~In a further related embodiment in claim 3 a modulated flexible grating is utilized to detect smaller wavelength bandwidth by jittering or stressing the grating.~~

~~These embodiments are capable of capturing the entire spectral energy content of a scene imaged onto the pixel sensors. The spectrum covered, depending on the parameters of the spectral separator and spectrophotometer described herein, may span from the x-ray region, through the ultraviolet, the visible, to the far infrared. Other related embodiments include an apparatus that implements the above methods.~~

A method according to claim 1, wherein dispersing spectral energy includes using a diffraction grating and using the grating includes modulating it to detect smaller wavelength bandwidth by jittering or stressing the grating.

5. (NEW) A method according to claim 1, wherein dispersing spectral energy includes using a diffraction grating.

6. (NEW) A method according to claim 1, wherein the spectral energy content is in the x-ray region.

7. (NEW) An apparatus for capturing spectral energy content of an image, the apparatus comprising:

a. a device that segments the image into an array of pixels, each pixel of the image having an electromagnetic spectral energy function;

b. for each pixel of the array,

(i) a diffraction grating that disperses spectral energy from such pixel into resolved spectral components in a spectrum of interest; and

(ii) a spectrophotometer that determines an amplitude value for each of the resolved spectral components.

8. (NEW) An apparatus according to claim 7, wherein the device that segments the image includes a fiber optic bundle.

9. (NEW) A method according to claim 7, wherein the spectrophotometer includes a linear array of photo-detectors.

10. (NEW) A method according to claim 7, further comprising:

a modulator that modulates the diffraction grating to detect smaller wavelength bandwidth by jittering or stressing the grating.

11. (NEW) A method according to claim 7, wherein the spectral energy content is in the x-ray region.